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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,827	CAMMAS ET AL.	
	Examiner	Art Unit	
	HEE-YONG KIM	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *48-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *48-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. **Claim 58** is objected to because of the following informalities: it recites "the **nose** of a meshing in an image". In the light of specification, the examiner believes that it is a typographical error and maintains that **node** of a meshing is correct word. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 48-49, and 67** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **Claim 48**, it recites "a corresponding estimated image" at line 13 and line 16. However, it is not clear whether it refers the same one. For the purpose of the application, the examiner interprets them as different.

Regarding **Claim 49 and 67**, they recite "and/or" which is indefinite. For the prosecution of the application, the examiner interprets it as "or".

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 61-63** are rejected under 35 U.S.C. 101 because they claim **signal** which is non-statutory.

6. **Claim 71** is rejected under 35 U.S.C. 101 because they claim **digital data carrier** which is non-statutory.

7. **Claims 72-73** are rejected under 35 U.S.C. 101 because they are directed to towards non-statutory subject matter.

A). The Examiner notes that "comprising instructions..." does not specify how the instructions are (a) associated with the medium, or (b) the nature of instructions. Data structures not claimed as embodied (or encoded with or embedded with) in a computer readable medium are descriptive material per se, and are not statutory, Warmerdam, 33 F.3d at 1361, 31, USPQ2d at 1760). Specifying the association in the manner listed above would sufficiently address the first condition. Similarly, computer programs claimed as computer listings, instructions, or codes are just the descriptions, expressions, of the program are not "physical things". They have neither computer components nor statutory processes, as they are not "acts" being performed. In contrast, a claimed "... computer readable medium encoded with a computer program..." is a computer element which defines structural and function interrelationships between the computer program and the rest of the computer, and is statutory, ~ 32 F.3d at 1583-84, 32 USPQ2d at 1035. Specifying the instructions as a "computer program" would sufficiently address the second condition,Interim Guidelines, Annex IV (Section a).

B). Lastly, the computer program as claimed doesn't isn't properly associated with the operation. It is quite possible that the computer program may be an unrelated sub-routine or a simple commence instruction which then causes the computer to execute the operation that could be self-resident, and not encoded on the medium. The Examiner suggests that the computer program be more directly associated with the operation, Interim Guidelines, Annex IV (Section b). Corrections to the claims, and supporting specification are required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 48-57, 60, 64-69, and 72-73** are rejected under 35 U.S.C. 102(b) as being anticipated by Cammas (Proceedings of SPIE-IS&T, vol.5022, pp.358-365) (hereafter referenced as Cammas) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cammas.

Regarding **claim 48**, Cammas discloses Fine Grain Scalable Video Coding Using 3D Wavelets and Active Meshes. Cammas specifically discloses Method for the encoding of a sequence of source images(Fig.5, General view of the analysis-synthesis video coding scheme), implementing a motion/texture decomposition (Decoupling motion/texture, Fig.5), producing, for at least certain of the source images, information

representing motion (Hierarchical motion representation, pp.363, line 10), called motion images (motion information, pp.363, line 17), and information representing texture (texture, pp.363, line 12), called texture images, and wavelet encoding (wavelet transform, pp.363, line 9),

characterized in that the method comprises the following steps:

- estimating the motion (3.2 motion estimation, pp.360, line 1-9) so as to obtain said motion images (active meshes, pp.360, line 1-9);
- projecting (frames are mapped on pp.360, line 8) each of said source images on at least one reference grid (reference grid, pp.360, line 8) so as to obtain said texture images (texture information, pp.360, line 8-9), on which the effect of the motion has been cancelled (a temporal transformation is performed along the motion trajectories, pp.360, line 13);
- comparing a motion image and a corresponding estimated image so as to obtain a motion difference image (temporal transform in Fig.5 applies to both Motion as well as text, to get the difference), called a motion residue;
- comparing a texture image and a corresponding estimated image so as to obtain a texture difference image (temporal transform in Fig.5 applies to both Motion as well as text, to get the difference); and
- independent wavelet encoding of said motion residues and said texture residues (Fig.5 shows decoupling Motion/Texture and Coding independently)

Regarding **claim 49**, Cammas, as applied to claim 48, teaches *characterized in that said comparison implements a difference with an interpolated image using at least the first and/or the last image of said sequence* (Fig.7 Lifting Scheme).

Regarding **claim 50**, Cammas, as applied to claim 48, *characterized in that a temporal encoding* (temporal transformation, Fig.5) *of said texture is performed, being rectified by said motion* (wavelet transform along the motion trajectory, pp.360, 3.3 Temporal Transform) *preliminarily encoded along the temporal axis, by means of a wavelet encoding* (temporal subbands are then transformed by 2D Spatial wavelet transform, pp.362, chapter 3.4 Coding Strategy).

Regarding **claim 51**, Cammas, as applied to claim 48, discloses *characterized in that it comprises an encoding of the texture comprising a temporal wavelet encoding followed by spatial wavelet encoding* (temporal subbands are then transformed by 2D Spatial wavelet transform, pp.362, chapter 3.4 Coding Strategy).

Regarding **claim 52**, Cammas, as applied to claim 48, characterized in that it comprises a motion encoding that takes account of a meshing. (active meshes, pp.360, chapter 3.0 Motion estimation).

Regarding **claim 53**, Cammas, as applied to claim 48, discloses *characterized in that it comprises a motion encoding comprising a temporal wavelet encoding followed by spatial wavelet encoding* (temporal subbands are then transformed by 2D Spatial wavelet transform, pp.362, chapter 3.4 Coding Strategy).

Regarding **claim 54**, Cammas, as applied to claim 48, discloses *characterized in that that said source images are grouped together in image blocks comprising a*

variable number (N) of source images (Group of N frames, pp.360, chapter 3.2 Motion estimation).

Regarding **claim 55**, Cammas, as applied to claim 54, discloses *characterized in that two successive image blocks comprise at least one common image* (Motion Estimation between successive frames using active meshes, chapter 3.2 Motion estimation).

Regarding **claim 56,** Cammas, as applied to claim 48, discloses *characterized in that said source images are grouped together in image blocks* (Group of N frames, pp.360, chapter 3.2 Motion estimation) *and, in each of said image blocks, the motion of all the images of an image block is estimated from the first image of said block* (Successive lifting steps P and U are performed, pp.362, line 4, therefore the information of the first frame is used for all the images).

Regarding **claim 57,** Cammas, as applied to claim 48, discloses *characterized in that that said source images are grouped together in image blocks* (Group of N frames, pp.360, chapter 3.2 Motion estimation) *and said projection step uses two reference grids respectively representing the first and last images of the block considered* (predicted using bi-directional compensation, pp.359, line 12-15, and Fig.4).

Regarding **claim 60,** Cammas, as applied to claim 48, discloses *characterized in that the encoded data are distributed into at least two layers (scalable coder, pp.362, line 10), a bottom layer* (inherent in scalable coder) *comprising data enabling an image of coarse quality to be reconstructed and a top layer* (inherent in scalable coder) *enabling the quality of said coarse image to be refined.*

Regarding **claim 64,** Cammas, as applied to claim 48, discloses Method for the decoding of a sequence of source images (Fig.5 General view of the analysis-Synthesis video coding scheme), encoded (For encoding, see the above claim 1)by an encoding implementing a motion/texture decomposition, producing, for at least certain of said source images, information representing motion, called motion images, and information representing texture, called texture images, and wavelet encoding, characterized in that said wavelet encoding being applied to difference images, called residues, obtained by comparison between a source image and a corresponding estimated image (For encoding, see the above claim 1), it comprises the following steps:
decoding the motion (Coding at Fig.5 includes both encoding and decoding of motion), in taking account of at least certain of said residues pertaining to the motion (temporal transform in Fig.5 applies to both Motion as well as text, to get the difference), to form motion images; decoding the texture (Coding at Fig.5 includes both encoding and decoding of texture), in taking account of at least certain of said residues (temporal transform in Fig.5 applies to both Motion as well as text, to get the difference) pertaining to texture, to form texture images; and synthesizing a sequence of decoded images (Synthesis, Fig.5), corresponding to said sequence of source images, by projection of said texture images on said motion images (mapping texture informations on their original grid, pp.362, first line below chapter 3.5 Synthesis).

Regarding **claim 65,** Cammas, as applied to claim 64, discloses *characterized in that it comprises a measurement step of the quality of said sequence of decoded images* (measurement represent texture quality of reconstructed video sequence,

pp.362, line 21-24), *by analysis of the distortion between the original texture images and decoded texture images* (Texture PSNR is estimated between the texture and frames and decoded texture frame, pp.362, line 21-24).

Regarding **claim 66,** Cammas, as applied to claim 64, discloses *characterized in that it comprises a management step of the reversals* (mapping texture informations on their original grid, pp.362, first line below chapter 3.5 Synthesis, which is equivalent to reversal of projection of a mesh to a reference grid) *generated by said motion estimation.*

Regarding **claim 67,** Cammas, as applied to claim 64, discloses *characterized in that it comprises a stopping step of the processing of said residues, when a level of quality and/or a quantity of processing operations to be performed is attained* (video bitstream can be decoded at different qualities associated with different bitrates, pp.362, line 13-14).

Regarding **claim 68**, the claimed invention is a device claim corresponding to the method claim 48. Therefore, it is rejected for the same reason as claim 48.

Regarding **claim 69**, the claimed invention is a device claim corresponding to the method claim 64. Therefore, it is rejected for the same reason as claim 64.

Regarding **claim 72**, the claimed invention is a computer readable medium claim corresponding to the method claim 48. Therefore, it is rejected for the same reason as claim 48.

Regarding **claim 73**, the claimed invention is a computer readable medium claim corresponding to the method claim 64. Therefore, it is rejected for the same reason as claim 64.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claim 58** is rejected under 35 U.S.C. 103(a) as being unpatentable over Cammas in view of Van Beek (US 5,936,671) (hereafter referenced as Van Beek).

Regarding **claim 58**, Cammas discloses everything claimed as applied above (see claim 48). Cammas further discloses *characterized in that it comprises: projecting step of an image on at least one reference grid* (frames are mapped on reference grid, pp.360, line 8), *corresponding to a sampling grid defined by the position of the node* (inherent in mesh because mesh is polygon such as triangle) *of a meshing in an image, so as to obtain a texture mask (texture to be mapped, pp.359, last 2 lines).*

However, Cammas fails to disclose *a detection step of at least one image support zone that has remained undefined after said projection of an image, owing to the use of a reference grid corresponding to another image, and a padding step of the said undefined image support zone or zones.*

In the analogous field of endeavor, Van Beek discloses Object –Based Video Processing Using Forward-Tracking 2-D mesh layers. Van Beek specifically discloses *a detection step (Fig.5) of at least one image support zone that has remained undefined (Fig.5: pixels not inside the VOP boundary) after said projection of an image (mesh boundary must always fall exactly on the actual video object plane boundary), owing to the use of a reference grid corresponding to another image, and a padding (Fig.5: need to be Padded) step of the said undefined image support zone or zones,* in order to map the pixels inside of mesh but outside of VOP (Fig.5).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Cammas by providing *a detection step of at least one image support zone that has remained undefined after said projection of an image, owing to the use of a reference grid corresponding to another image, and a padding step of the said undefined image support zone or zones*, in order to map the pixels inside of mesh but outside of VOP. The Cammas Fine Grain Scalable Video Coding using 3D wavelet and Active Meshes, incorporating a computing device, further incorporating the Nelson anti-symmetric wavelet coefficients, further incorporating the Van Beek mapping the pixels inside of mesh but outside of VOP by padding, has all the features of claim 58.

12. **Claim 59** is rejected under 35 U.S.C. 103(a) as being unpatentable over Cammas in view of Nelson (PhD Thesis, Anglia Polytechnic University, 2001) (hereafter referenced as Nelson).

Regarding **claim 59**, Cammas discloses everything claimed as applied above (see claim 48). However, Cammas fails to disclose *characterized in that an antisymmetry is applied to the wavelet coefficients corresponding to an edge of the image so as to simulate a signal with support of infinite length.*

In the analogous field of endeavor, Nelson discloses The Construction of Some Riesz Basic Families and their Application to Coefficient quantization, Sampling Theory, and Wavelet Analysis. Nelson specifically discloses that *antisymmetry* (Symmetry or Anti-symmetry is imposed upon an orthonormal wavelet, pp.7, last 2 lines) *is applied to the wavelet coefficients corresponding to an edge of the image, in order to simulate a signal with support of infinite length* (infinite support, pp.8, line 16).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Cammas by providing antisymmetric the wavelet coefficients corresponding to an edge of the image, in order to simulate a signal with support of infinite length. The Cammas Fine Grain Scalable Video Coding using 3D wavelet and Active Meshes, incorporating a computing device, further incorporating the Nelson anti-symmetric wavelet coefficients, has all the features of claim 59.

13. **Claim 70** is rejected under 35 U.S.C. 103(a) as being unpatentable over Cammas.

Regarding **claim 70**, Cammas discloses everything claimed as applied above (see claim 48). However, Cammas fails to disclose Data server characterized in that it comprises means to implement the encoding method according to any of the claim 48.

However, it was well known in the art that wavelet coding requires a computing device (*data server*) such as a computer or dedicated hardware, in order to perform computations and storing data for wavelet coding.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Cammas by providing a computing device, in order to perform computations and storing data for wavelet coding. The Cammas Fine Grain Scalable Video Coding using 3D wavelet and Active Meshes, incorporating a computing device, has all the features of claim 70.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/HEE-YONG KIM/
Examiner, Art Unit 4192

/Andy S. Rao/
Primary Examiner, Art Unit 2621
June 7, 2010